

NEW SUBSPECIES IN HAPLOPAPPUS

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HAPLOPAPPUS RACEMOSUS (Nutt.) Torr. in Sitgreaves Rep. 162. 1854.

While determining a number of collections of the composite genus *Haplopappus*, section *Pyrocoma*, my attention was drawn to a pair of undescribed subunits within *Haplopappus racemosus* (Nutt.) Torr. Dr. H. M. Hall¹ took a conservative view toward the species of this genus and brought together a variable assemblage of forms under *H. racemosus*. In going over the collections at the University of California, Stanford and Carnegie Institution, I find, as Hall did, that the series of forms which Hall maintained in *H. racemosus* does not present large gaps that might be used advantageously for dividing it up into several species. The gaps that are discernible may perhaps as well be considered as the marks of geographic subspecies as of species. Lacking all cytogenetic and other experimental data on the group, there seems to be no justifiable basis for following out my first inclination at least to segregate those plants of alkaline from those of non-alkaline soils into different species. So I am content to describe the present new units as subspecies of *H. racemosus*,* although they represent very different portions of the series of variations and do not seem at all compatible in the same species unless the entire gamut of variation is viewed at one time.

Hall has recognized nine subspecies of *H. racemosus*. In the major division of his key to these subspecies, he has separated subspecies *typicus*, *congestus* and *duriusculus* from the remainder on the following characters: "Leaves not thick, the lateral veins visible (least so in *typicus*, known by its large heads). Plants of non-alkaline soil." The latter point does not hold for subsp. *duriusculus*, as one can determine from the labels on the specimens, and in his discussion of the ecology of the species Hall remarks, "With the exception of *typicus* and *congestus*, all of the subspecies of *Haplopappus racemosus* are indicators of an alkaline or saline soil."

Material of the first of the following entities was unknown to Hall, but of the second he had available a single sheet which he placed under subsp. *duriusculus*.

HAPLOPAPPUS RACEMOSUS subsp. *pinetorum* subsp. nov. Caulibus erectis strictis tenuibus 2-5 dm. altis stramineis; foliis radicalibus lanceolatis acutis ad basim attenuatis integerrimis vel echinato-denticulatis 6-20 cm. longis, 5-16 mm. latis gracilibus utrinque pilosis haud glandulosis; inflorescentia plerumque racemosa interdum paniculata internodiis longis; involucri hemi-

¹ The Genus *Haplopappus*. Carnegie Inst. Wash. Publ. 389: 127-144. 1928.

sphaerico 10–13 mm. alto, 12–15 mm. lato, squamis imbricatis oblongo-lanceolatis acutis obtusisve mucronatis dense pilosis, marginibus anguste hyalinis; acheniis sericeis.

This subspecies is known only from the type collection made in the Scott Mountains of southern Siskiyou County, California, on the ridge between Mill and Mule creeks, three miles south of Scott Mountain Lodge, at 1340 meters elevation, August 8, 1938, *Keck 4862* (SU, type; isotypes, C, CI, Po, US). The specimen was taken in non-alkaline soil among scattered chunks of lava under a forest cover of *Pinus ponderosa*.

The closest relative of subsp. *pinetorum*, probably both morphologically and geographically, is subsp. *congestus* (Greene) Hall. The latter is likewise a dweller in openings in coniferous woods, excepting that of subsp. *typica*, a habitat very different from those occupied by the other subspecies, which are found under varying degrees of alkalinity up to *Distichlis* covered salt flats. Subsp. *pinetorum* differs from subsp. *congestus* in the spiny-toothed leaves, the much more densely pilose herbage, the less anthocyanous, more slender, more strictly erect stems, and in the arrangement of the inflorescence, which instead of being typically glomerate-spicate as in subsp. *congestus*, is openly spicate or racemose, with rather long internodes, or, in robust specimens, even corymbosely paniculate. Whereas subsp. *congestus* is found in Jackson, Josephine and possibly Curry counties, southwestern Oregon, and Del Norte County, California, subsp. *pinetorum* is some seventy-five miles distant from the nearest known station of subsp. *congestus* in quite another mountain system.

The occasional occurrence of corymbosely paniculate inflorescences causes some speculation as to whether or not this subspecies should not be referred to *Haplopappus lanceolatus* (Hook.) Torr. & Gray, which is differentiated from *H. racemosus* principally on the basis of this character. Because *H. lanceolatus* is thought to be limited to alkaline soils and is not found west of the Great Basin, there seems to be no doubt that the present unit is more closely related to *H. racemosus*, which occurs nearer at hand with a subspecies of non-alkaline habitats. However, the occasional, previously recognized unreliability of the inflorescence character in separating these two large species from each other is made more apparent with the discovery of the present unit.

HAPLOPAPPUS RACEMOSUS subsp. lucidus subsp. nov. Caulibus erectis, strictis 2–4.5 dm. altis pallidis; foliis plus minusve vernicosis glaberrimis alternis (rare inferis oppositis) lanceolatis acutis integerrimis vel argute dentatis scabridulo-ciliolatis, radicalibus petiolatis 6–15 cm. longis, 7–23 mm. latis; inflorescentia glomerato-spicata vel racemosa; involucri campanulato 9–13 mm. alto, 9–20 mm. lato, squamis paucis subaequalibus laxe imbricatis lanceolatis attenuatis glaberrimis viscidissimis; acheniis sericiis.

In alkaline grassy flat, one mile west of Portola, Plumas County, California, at 1480 meters elevation, August 9, 1938, *Keck 4897* (SU, type; isotype, CI); also collected at Portola, in 1913, *Katherine Brandegee* (C).

The Brandegee specimen was cited by Hall (*op. cit.*) under *H. racemosus* subsp. *duriusculus* (Greene) Hall. He cited only two other collections under this subspecies, both from eastern Oregon. These differ from the Portola material in lacking the dense glandular exudate which makes the latter glisten, and in having broader, lance-oblong, sharply acute, more definitely seriated and imbricated and wider hyaline-margined involueral bracts. These characters, together with the appreciable geographic gap between Malheur County, Oregon, and Plumas County, California, set off obviously distinct subspecies. The relationship of subsp. *lucidus* with the other subspecies of the complex is less close.

HAPLOPAPPUS EXIMIUS Hall, Univ. Calif. Publ. Bot. 6: 170. 1915.

This species may now well be broken up into two very distinct geographic subspecies following intensive botanical exploration of the crest and eastern flank of the Sierra Nevada in recent years by the men making the Vegetation Type Map Survey of the United States Forest Service, by Frank W. Peirson of Altadena, by the Carnegie Institution of Washington, and others. No colonies of this species have been found between Eldorado County and Inyo County as Hall expected there might be when he pointed out the significant morphological differences that separate the Inyo County material from that in the mountains about Lake Tahoe (Carnegie Inst. Wash. Publ. 389, p. 182, 1928). These differences may be brought out as follows:

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| Involucres 7.5–10 mm. high, 12–15 mm. wide (pressed), shorter than the disk-flowers, the outer bracts spatulate-oblong to oblong-obovate, rounded or obtuse, mucronate (the outermost bracts foliose); disk-corolla 6–7 mm. long, equalled by the pappus; lower cauline leaves 7–15 mm. wide. | 1a. <i>H. eximius</i>
subsp. <i>typicus</i> |
| Involucres 14–18 mm. high, 20–30 mm. wide (pressed), equaling the disk-flowers, the outer bracts lanceolate or lance-oblong, obtuse or acute, (the outermost bracts foliose); disk-corolla 9–10 mm. long, one fourth longer than the pappus; lower cauline leaves 10–25 mm. wide. | 1b. <i>H. eximius</i>
subsp. <i>Peirsonii</i> |

1a. *HAPLOPAPPUS EXIMIUS* subsp. *typicus* nom. nov.

Haplopappus eximius Hall, *loc. cit.*

Tonestus eximius Nels. & Macbr. Bot. Gaz. 65: 70. 1918.

High mountains in the region of Lake Tahoe, from southern Washoe County, Nevada, to Eldorado County, California. Type

locality: crevices of granitic rocks at an altitude of 2680 meters on a peak 1 kilometer south-southwest of Angora Peak, El Dorado County, California.

NEVADA. Washoe County: Broncho Creek, *Kennedy 1363* (RM). CALIFORNIA. Lake Tahoe, summer 1928, *Vortriede* (CAS). Eldorado County: peak south-southwest of Angora Peak, July 1910, *Geo. R. Hall* (C, type; isotypes, C, GH, US); Ralston Peak, July 30, 1910, *Geo. R. Hall* (B, C, CI, Cop, G, GH, K, Po, SU); *Geis 18* (C), *Smiley 417* (GH); Star Lake, July 24, 1918, *Evans* (C).

1b. *HAPLOPAPPUS EXIMIUS* subsp. *Peirsonii* subsp. nov. Maioribus; foliis inferioribus 10–25 mm. latis; involucri 14–18 mm. alto, 20–30 mm. lato, squamis exterioribus e lanceolatis usque ad oblongis acutis vel obtusis; disci corollis 9–10 mm. longis, quam pappi setis aliquanto longioribus.

This subspecies is known only from high elevations along the eastern flank of the Sierra Nevada in Inyo County, California. It is named in honor of Frank W. Peirson, of Altadena, California, who for many years has made invaluable collections from some of the least known portions of the Sierra Nevada.

Inyo County: Transverse Ridge, Upper Rock Creek Lake Basin, northwestern corner of Inyo County, 3380 meters (11,100 feet) altitude, Aug. 5, 1933, *Frank W. Peirson* (C, type; isotype, SU); Long Lake, Upper Rock Creek Lake Basin, 3260 meters, *Peirson 9077* (CAS, CI); North Fork Bishop Creek, 3050 meters, *Peirson 2517* (C); Taboose Pass, 3280 meters, Aug. 18, 1921, *Peirson* (C); Sawmill Pass, 2950 meters, *Peirson 1404* (C).

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THE IDENTITY OF MADIA DISSITIFLORA (NUTT.)

TORR. & GRAY

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Madia gracilis (Smith) comb. nov.

Sclerocarpus gracilis Smith, in Rees' Cycl. 33: *Sclerocarpus*, sp. 2, 1819.

Madorella dissitiflora Nutt., Trans. Amer. Phil. Soc. ser. 2, 7: 387. 1841.

Madia dissitiflora Torr. & Gray, Fl. N. Amer. 2: 405, 1843.

Madia sativa var. *dissitiflora* Gray, Proc. Amer. Acad. 9: 189. 1874.

Madia sativa subsp. *dissitiflora* Keck, MADROÑO 3: 4. 1935.

Since the publication of *Madia sativa* subsp. *dissitiflora* in 1935, we have learned through additional garden experiments that the unit should stand as a distinct species.